

Santa: Broadcasting from the University of British Columbia. This is Blue and Goldcast. I'm Santa Ono, the president and vice-chancellor of UBC. On this season of the *Blue and Goldcast*, I'm speaking with the people who are leading some of the most innovative and creative work coming out of our campuses.

Today, I'm joined by Dr. Daniel Vigo, assistant professor at UBC's Institute of Mental Health. Dr. Vigo started work on a study to analyze the mental health of students on campus right before COVID-19 hit BC. As you can imagine, this changed the outcomes of the study in unexpected and fascinating ways. He's now working on an app called Minder, designed to help students get the mental health support they may need. Daniel Vigo, welcome to *Blue and Goldcast*. Thanks so much for joining me today.

Dr. Daniel Vigo: Hello, Santa. It's a pleasure to be here with you, and I'm happy to be able to share the news and the findings of our research project.

Santa: Let's start at the very beginning. What were the goals of the original research project? Can you give us an overview?

Daniel: Yes. This is an international collaboration. It's a WHO World Mental Health Surveys Initiative, which is actually the largest global collaboration of psychiatric research of primary psychiatric epidemiology. It has one specific subpopulation that we focus on, which is university students. This survey, this type of project has been launched in more than 10 countries, in various universities in each country. UBC is the Canadian site, the base, and other Canadian universities have also joined us in the different components of this project.

The goal originally was to understand the mental health and substance use behaviors and needs of the university students. We had decided with Ron Kessler, who is the USBI or the global BI, I should say, of the surveys. We said, instead of doing the classic cross-sectional survey, where you send an invitation to all the students in the university once and then analyze the data, we said, "Let's just do a weekly survey, what's called a trend study, where we invite a valid or a representative sample of the population to get valid results."

We do that by obtaining stratified random samples every week and sending out the invitations to 350 students. We started doing that because we wanted to see how some of the predictable and unpredictable exposures affect student mental health. We were thinking of forest fires. We were thinking of some of the catastrophes and manmade or otherwise that periodically hit our global and Canadian and BC population, and also the usual things like exams, or vacations, or predictable changes in student life.

We launched in early February and within one month, we realized that we had a unique instrument to track the way that COVID impacted student mental health, and we did that. Now, we have a trove of data with our 9,000 respondents that are representative of not only the UBC population, but also SFU, McMaster, and UFT to join next month, where we can ask all sorts of questions about student behavior, about student mental health, substance use in response to COVID or not. That's the first part. Then the second part, which is, as you said, the app is, okay, based on all

these things we know, we are now able to co-design with students the interventions they would like to see to address these problems.

Santa: You launched this in February of 2020. Four weeks after that, COVID-19 was realized to be a big stressor and so you had to amend the entire survey. Tell us about how that felt.

Daniel: We included quite rapidly-- Even before February ended, we included COVID-related questions, which of course we had to design as a research team, talking with our student advisory committee, talking to our student team. We have a large student team in my lab that are part of the staff. We first created a first set of COVID-related questions, run them through ethics, a lot of back and forth, because as you can imagine, there was a lot of concern for how COVID may impact mental health and how questions about COVID may impact a student well-being.

They were extremely helpful and rapid in their analysis. We had those questions within the week. We sent them, or even in a couple of days, and then we included another round of questions after we had a little bit more time to consider things to ask. For example, we included a question that has been very, very enlightening, which was about the emotional impact, whether students have been emotionally affected by COVID, overwhelmed but able to manage, overwhelmed but able to find help, or overwhelmed and unable to find help.

One of the most interesting things is that in line with what researchers are finding in many subpopulations, in general, UBC students are very resilient. They have managed well. About 20% were unaffected, about 50% were affected but managed well. There was another 20% or so that was overwhelmed but able to find help, but there's a 10% that was really affected and unable to find help. This pattern where most of the population is able to cope with it but there's a subgroup that needs to be helped in a more assertive manner is a frequent finding across populations.

Santa: What were the main factors having an effect on students' mental health during this course of studies?

Daniel: We found that things like the type of housing that they're at, whether they live with the parents or not. We found something very interesting, which is a proximity to a COVID case, meaning knowing someone with COVID actually increased the level of anxiety, but very interestingly, the increase in anxiety due to the proximity of COVID was largely at the expense of an increase in anxiety in male students. Female students, though they had higher baseline anxiety, seem to be more resilient to the impact of this external stressor, which was an interesting finding that we hadn't seen before confirmed in this way.

Then we found different patterns of behaviors related to mental health issues with combined with some substance use patterns. We looked at how students adhere or don't adhere to the Canadian low-risk guidelines. For example, for alcohol or for cannabis in light of the more recent legalization is another interesting behavioral change that we have been studying. We found, again, most students are stressed, have anxiety and depression, but are able to cope well, but there's a group of students, which is large, it's actually the third largest group, which has concurrent

problems with mental and substance use-related issues that can be the focus and are being the focus of the intervention that we are co-developing.

Santa: If you actually looked at 10% that you said couldn't cope well, was that a surprising group in any way, or is it almost predictable that they would be the most affected by COVID?

Daniel: The thing that is-- I don't know if it was predictable, but it is kind of intuitive. It is that the ones that were overwhelmed in a truly negative way are the ones that were not able to find help. Just to break that question apart, maybe the assertiveness of the community in reaching out to people who may be overwhelmed, and yes, there are some groups in which we have found, for example, an increase in suicidality during the time of COVID that, again, is in general related to the difficulty in accessing services. The difficulty that doesn't happen across the board, but that when it happens, it seems to make a difference.

Indeed, when we looked at the evolution throughout the COVID of suicidality, we saw that in fact, there's a significant decrease in suicidality, particularly during the first, I would say, six to nine months of the pandemic, which then starts to pick up again. It has a cubic function shape. What we found is that despite that general decrease, there is an increase again in suicidality for people who were not able to access help. Then, there are also some specific personal traits that we are studying as we speak and developing a draft, that we will soon be submitting for peer review, where we try to identify which are the drivers of this increased suicidality and difficulty in finding help.

Santa: Now, during this whole COVID period, I know because I was very involved in working with both provincial and federal government in supports for students. There are well-known dates at which there were announcements for significant financial supports and other supports for students that would affect broadly the UBC student body. Have you analyzed the data to see whether there are any peaks or a resolution of anxiety during this period that coincide with governmental announcements of support?

Daniel: That is part of what we're doing now. There are a couple of weeks because we included in the models dummies for each week, meaning for the whole curve of change of anxiety, suicidality, depression, we control for whether the week makes a difference. As I said, in some cases, we do see a significant decrease in the negative outcomes. It will be a good time to touch base with you and see which are the weeks that you had given your involvement with high-level decision-makers would be the ones to scrutinize and see if there's any or, rather, if a significant difference that we do see, because there are a couple of weeks whether there's a clear shift to there that we have not yet interpreted, coincides with one of these announcements.

Santa: I'll be happy to do that with you. Now, you've talked a little bit about the differences between men and women, different populations and their ability to access support but also their resilience, but we don't live in a strictly binary world. I was wondering if your study was large enough to have representation of trans and LGBTQ students so that if you could see any differences in resilience in those groups?

Daniel: Yes. That's a great question. In our first study where we looked at just the first wave, our n, our number of respondents, was not large enough to have a large group of LGBTQ respondents. Since the number of respondents was small, we did not show them in order to protect confidentiality and so that they cannot be identified. However, now that we have 9,000 respondents, we do have larger numbers of respondents with each of the different outcomes of interest, and we will be definitely able to report on that.

I also want to point out that we have a Student Advisory Committee and we have a very engaged student body that sends us emails when they receive the survey. Thanks to those emails, and thanks to the deployment of our survey, we were able to change our questions, to modify our questions to include certain responses that our student body told us. For example, in a question related to gender, it would be better to frame it this way so as not to assume a given, a specific type of gender classification, et cetera. We were able to follow up on that. Now, we have, I think, we capture the granularity of the gender identities that the student body has.

Santa: Fantastic. Now speaking of support, let's talk a little bit about Minder. How did the results of this study lead to the development of this app?

Daniel: That's a fascinating aspect of this. We also started developing the app, I would say, about a little more than a year ago. Though originally, it was going to be taking an app that exists out there that was developed by a commercial company, and we would adapt it for students in Canada and at UBC. Rapidly as we started working with students, we realized that that was not the way to go. The way to go was to actually co-develop the app with the end users.

In fact, given the time that passed for Health Canada to evaluate the project, we were able to learn from other sites that those prepackaged apps with modules and homeworks and this and that, they're really not very appealing to young people and to students. We took the challenge. We took up the challenge of co-developing the app from the ground up. The students from the Advisory Committee, which by the way, represent every or almost every student group on campus, everyone that we could find through a mapping exercise, they told us a couple of things.

First, the main guiding concept was that apps are good but if they connect you to the real world, they're much better. That's why we created three components, the intervention component which is a chatbot and videos, a services component which matches the student with the service that is most likely to be helpful to that student given their specific needs, and also a community component which matches students with existing student groups based on their preferences and interests.

This was one immediate way in which the orientation of our Student Advisory Committee helped us shape something that I think will be totally unique. Then to your point, the responses to the survey showed us, for example, that alcohol consumption in general, let's say as something that people do across the week, is not the problem here at UBC, as is not the problem in many other universities. The problem is binge drinking, for example. We identified the problem and then we say, "Okay, there are these evidence-based interventions for high-risk alcohol use. What kind of interventions would be useful?"

We started brainstorming with students and we have created a number of chatbot-based interventions, meaning it's a conversational agent, as if you were chatting with someone else on a messaging app. The automated chatbot asked you things about your alcohol consumption, for example, asks you where do you think your consumption level stacks up to the rest of the population, and then shows the user the actual consumption in the distribution within the UBC student population to help, because there's usually a misperception that all students are drinking all day, et cetera, et cetera.

That sometimes has an unwanted effect on the person who thinks that everyone's drinking so much, that my drinking is probably not that bad. We're able to accompany the user in that journey of identifying what their own goals are. For example, they can tell to the app, "Well, I'm meeting some friends at the pub on Friday, and my goal is not to drink more than three beers."

The app, the Minder, starts when they get to the pub and asks them, "Have you had a drink of water?" "Have you had something to eat between your drinks?" "You reached three. Bear in mind that if you go over that, maybe you will choose not to have one for some days." Anyhow, all of these things can be programmed by the user by the student. We feel that this is an innovative way to combine the actual empirical information about a population's level of need with interventions that combine the evidence base with the desires and preferences of the population that is the target.

Santa: Well, it's pretty remarkable. You basically have built in an ability to monitor your substance use and, through this automated function, make sure that you check in and can monitor whether you're managing the situation. I guess it's in initial trials. Do you plan to sell this app? What do you plan to do? Who do you want to give it to?

Daniel: No. This app is a public good. The goal is to create something that is free to use for all Canadian university students. We have three testing phases, a user testing boot camp. It was going to be an in-person boot camp where 50 students would test the app and we would be there with iPads, seeing what they like, what they don't like, asking them questions, blah, blah, blah. Of course, COVID happened and we had to do it online, and we did it about a month ago. We tested a preliminary version of the app with the videos, with the scripts, with the triage. What people liked, what people didn't like, this script's too long, this script it's too short. We would like more of this, more of that.

We love the community component, for example, which was an interesting find. Then next month, we're doing a feasibility study. This will be a randomized control trial with 100 students that will be randomized either to the intervention or to control. Of course, the control is no intervention but then after the trial, they will be able, of course, to use the intervention. The conversational agent based on some objective criteria, so for example, utilization, we think that this should work quickly. We have a two-week expectation of change, and then a four-week expectation of further change.

If that doesn't happen at two weeks, if we see that people are not using the app, we offer them peer coaching through texts. In addition to the chatbot, a student peer, meaning another UBC student who was trained by us to provide guidance in the

utilization of the app, has conversations with the user. If then even at four weeks we see that the actual mental health outcomes have not improved, meaning anxiety, depression, substance use, et cetera, we offer them psychosocial support, so empathetic listening, and more involved peer coaching, through video, through a video interface.

All of this developed with the most secure platform available in Canada with all bank-grade security, and EMR, meaning electronic medical record-grade security, measures for privacy of the data, and so on and so forth. After that round, we will see that everything worked, that the randomization protocol worked, that we were able to actually deploy our coaches which, by the way, we trained by leveraging the phenomenal work that has been done before us by UBC students.

AMS, the student government, has a peer coaching service that they train in collaboration with faculty, with staff, with the VP Student's Office, so there's a treasure trove really of resources, and we developed led by Priyanka Halli, one of our co-investigators who is a psychiatrist, and some of our students who were volunteers in the AMS peer coaching services.

We developed a manual that is very consistent with the AMS training so that this actually has high probability of uptake, because this training is already being given to students yearly. We would just have to tweak it, say, if we were able to, which is the ultimate goal of my research, which is integrating research into really functioning health systems if we were able to integrate this app as part of the overall services that the university provides.

The training is already there, it is not a huge cost. It is already being provided, students do it, students enjoy it, we got phenomenal reviews for the training, and we'll see, we'll test it for feasibility and for effectiveness. It's incredibly exciting. Maybe I haven't underscored enough that all of these things that I've just mentioned, from the video scripts to the chat scripts, to the mindfulness videos, all of those efforts were co-led by students, and really autonomously in many respects.

Santa: That's fantastic. Well, you want to make this app freely available so that students who are in crisis will receive the support seamlessly. What can the university do? We've been investing quite a bit on increasing the number of counselors and even hired a very high-profile chief mental health officer, as you know. We're really trying to build the infrastructure to support our students.

The connectivity between the app and student counseling, is there anything that you need from the university to make sure that happens seamlessly? You can imagine that even beyond counselors, it might be helpful if you can get an early sense that someone is verging towards crisis, that connecting with some sort of early alert system so that counselors in residence halls, or RAs, or faculty members-- Is it possible somehow for there to be an articulated system so that signs and symptoms that are manifesting in the hall residents, or in a school, or they're active together with this app can actually converge to make an even more robust support system for students?

Daniel: Absolutely. We have, for example, our app has a button which is like a life-saving device. They can press and it gives them the phones to call, et cetera, but we

could directly link that with student health services. We could directly link that to a geolocation that tells them where the nearest ER is or directly call a crisis line. All of those things are not only feasible but desirable because, by the way, what we found is that, as you know, there's a complexity in satisfying the need for mental health services. The students rightfully feel many times that there's not a match between their need and the services that they reach out to.

What I found or what we have found is that that is not for lack of services, that is frequently for lack of integration of services and lack of matching of the level of need with the level of services, and so a student with a mild to moderate depression goes to seek a psychiatrist, for example, and the waiting time for that will be never. Not because the psychiatrist doesn't want to give an appointment, it's because that it's an impossible match. Every health system that is rational such as the Canadian health system or a university health system needs to have what's called a tiered framework where a given level of need is met with an appropriate evidence-based level of resources.

The problem with students is that frequently, they don't have an orientation as to what is a good match for their needs. Well, we have a built-in function that matches the actual need with the actual services. By the way, this matching tool was designed by another research group here at UBC, and the HEARTSMAP-U tool, which we built into our app so as to not reinvent the wheel every time, but actually break down those silos and connect not only students with counseling but also researchers amongst ourselves.

The short answer to that is absolutely. As the same way we have the seamless automated transition of students between the trend study and student counseling, we could do a seamless transition of students between the app and student counseling, crisis services, student health services. It could be part of the enrollment package, it could be a part of what students know that they can reach out at any point when they're in crisis, they can hit that life life-saving device, or they can connect with existing services on campus.

Of course, as you said, there will be no cost associated with this, which is the beauty of this type of things. Once it's developed, it's a very resource-intensive thing to develop. As you can imagine, within a year, developing all of these technological innovations, because they weren't there, believe me. There were many a challenge that we had to navigate, but once it's there, the cost of maintaining it or scaling it up are minimal.

Santa: Well, thank you so much. I'm just blown away with what you've accomplished during this COVID year, and I think that the efforts of your team as well as students at UBC is going to pay back dividends for future students, not only here, but hopefully around the world. It's a really inspirational work.

Daniel: Thank you very much, President Ono, for your unwavering support and on your work on mental health.

Santa: Daniel, thanks so much for being on *Blue and Goldcast* today. Daniel Vigo is an assistant professor at the Institute of Mental Health. You can find out more about Minder, the app we discussed today at myminder.ca. That does it for this month's

episode. You can find links to our guests' work as well as the previous editions of this show at blueandgoldcast.com. You can also find us on your favorite podcast app like Apple podcasts or Stitcher. You can tweet me at @ubcpres, that's prez with a z. I'm Santa Ono, thanks for listening.